

Chapter C3: Monetized Benefits

INTRODUCTION

This chapter summarizes the regional and national benefits of the Final Section 316(b) Phase II Existing Facilities Rule. For a discussion of regional and national baseline losses, see Chapter C2 of this document.

Greater detail on the methods and data used in the regional analyses are provided in Chapter C1 of this EBA and in the Regional Study Document (U.S. EPA, 2004): the methods used to estimate impingement and entrainment (I&E) are described in Chapter A5; the methods used to estimate the value of the benefits of prevented I&E losses are described in Chapters A9 through A15; the results of the regional analyses are presented in Parts B through H; and a summary of national benefits is provided in Part I.

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C3-1 EXPECTED REDUCTIONS IN I&E

In order to estimate the benefits of the final Phase II rule, EPA estimated the percentage reductions in I&E that will be achieved by implementing the final rule at each in-scope facility. These estimates reflect EPA's assessment of (1) regulatory baseline conditions at the facility (i.e., current practices and technologies in place), and (2) the percent reductions in I&E that the Agency believes would result from technologies adopted to comply with the rule. EPA used these estimates to calculate the average reduction in I&E expected in each region.

Table C3-1 presents average regional expected reductions in I&E. The table also presents estimates of regional and national prevented I&E losses, expressed as (1) age-one equivalents lost, (2) fishery yield foregone, and (3) biomass production foregone. The table shows that, at the 554 national in-scope facilities, the final rule reduces age-one equivalent losses by 1.4 billion fish, prevents 64.9 million pounds of fishery yield from being lost, and prevents 217.1 million pounds of future biomass production from being lost. The expected reductions vary across the regions. Facilities in the Gulf of Mexico are expected to make the largest average percentage reductions in impingement (59.0 percent), and facilities in the Mid-Atlantic are expected to make the largest average percentage reductions in entrainment (47.9 percent). More than half of the age-one equivalent losses prevented by the final rule, 846.4 million fish, are attributable to facilities in the Mid-Atlantic region. The final rule prevents the most losses of fishery yield in the Mid-Atlantic region, and prevents the most losses of future biomass production in the North Atlantic region. More detailed discussions of regional benefits are provided in Sections B through H of the Regional Study Document.

Table C3-1: Expected Reduction in I&E Under the Final Rule, by Region

Region ^a	Expected Reductions in I&E Under Final Rule				
	Impingement	Entrainment	Age-One Equivalents (millions)	Foregone Fishery Yield (million lbs)	Biomass Production Foregone (million lbs)
California	30.9%	21.0%	66.4	6.1	9.2
North Atlantic	43.8%	29.1%	19.3	0.4	84.3
Mid-Atlantic	53.5%	47.9%	846.4	34.3	54.7
South Atlantic	43.7%	17.1%	76.7	5.3	6.3
Gulf of Mexico	59.0%	31.9%	89.6	13.8	16.5
Great Lakes	51.5%	40.1%	159.5	1.7	8.5
Inland	47.2%	16.4%	116.8	1.1	20.9
Total (weighted)	n/a	n/a	1,420.2	64.9	217.1

^a Regional estimates are unweighted. National totals are sample-weighted and include Hawaii. Hawaii benefits are calculated based on average expected reductions per MGD in the North Atlantic, Mid Atlantic, Gulf of Mexico, and California regions, and the total intake flow in Hawaii.

Source: U.S. EPA analysis, 2004.

C3-2 REGIONAL AND NATIONAL SOCIAL BENEFITS

In total, EPA found 554 facilities to be in scope of the final Phase II rule. However, the regional estimates of benefits under the final rule reflect only the 540 in-scope facilities that completed section 316(b) questionnaires (excluding three facilities in Hawaii). In order to calculate national benefits for all 554 facilities, including the three facilities located in Hawaii and the eleven other facilities that did not complete the questionnaire, EPA extrapolated benefits from other facilities and regions, based on intake flows and a set of statistical weights. See Chapter II of the Regional Studies document for a more detailed discussion of this extrapolation procedure.

As mentioned in Chapter A12, EPA estimated non-use benefits only qualitatively. As a result, the Agency was not able to monetize benefits for 98.2% of the age-one equivalent losses of all commercial, recreational, and forage species for the section 316(b) Phase II regulation. This means that the estimates of benefits presented in this section represent the benefits associated with less than 2% of the total age-one equivalents lost due to impingement and entrainment by cooling water intake structures (CWISs) and should be interpreted with caution. See Chapter A9 of the Regional Case Study document for a detailed description of the ecological benefits from reduced I&E.

Table C3-2 shows EPA's estimates of the monetary value of the I&E reductions presented in Table C3-1. The table shows that the final rule results in national use benefits of \$82.9 million per year (\$2002, discounted at three percent) and an unknown amount of non-use benefits. Recreational fishing benefits, which are \$79.3 million, make up the majority of total national use benefits. National commercial benefits are relatively small, at \$3.5 million. The final rule is expected to generate the largest commercial and recreational benefits in the Mid-Atlantic region (\$1.7 million and \$43.4 million, respectively), resulting in total use benefits in the Mid-Atlantic region of \$45.0 million. More detailed discussions of regional benefits are provided in Sections B through H of the Regional Study Document. Additionally, as a sensitivity analysis, the Appendix to this chapter presents the value of the benefits of the final rule evaluated at a seven percent discount rate.

Table C3-2: Summary of Social Benefits (millions; \$2002; 3% discount rate)^a

Region ^a	Use Benefits of I&E Reductions			Non-Use Benefits of I&E Reductions ^c	Total Benefits of I&E Reductions
	Commercial Fishing	Recreational Fishing	Total Use Benefits		
California	\$0.5	\$2.5	\$3.0	n/a	n/a
North Atlantic	\$0.1	\$1.4	\$1.4	n/a	n/a
Mid-Atlantic	\$1.7	\$43.4	\$45.0	n/a	n/a
South Atlantic	\$0.2	\$6.9	\$7.1	n/a	n/a
Gulf of Mexico	\$0.7	\$6.2	\$6.9	n/a	n/a
Great Lakes	\$0.2	\$14.0	\$14.1	n/a	n/a
Inland	n/a	\$3.0	\$3.0	n/a	n/a
Total (weighted)	\$3.5	\$79.3	\$82.9	n/a	n/a

^a Discounted to account for lag in implementation and lag in time required for fish lost to I&E to reach a harvestable age.

^b Regional numbers are unweighted. National totals are sample-weighted and include Hawaii.

^c EPA estimated non-use values only qualitatively.

Source: U.S. EPA analysis, 2004.

REFERENCES

U.S. Environmental Protection Agency (U.S. EPA). 2004. *Regional Studies for the Final Section 316(b) Phase II Existing Facilities Rule*. EPA-821-R-04-006. February 2004.

Appendix to Chapter C3

This appendix summarizes the monetary benefits of the final rule using a seven percent social discount rate instead of a three percent rate. The results of this sensitivity analysis are presented in Table C3-A-1.

Table C3-A-1: Summary of Social Benefits (millions; \$2002; 7% discount rate) ^a					
Region ^a	Use Benefits of I&E Reductions			Non-Use Benefits of I&E Reductions ^c	Total Benefits of I&E Reductions
	Commercial Fishing	Recreational Fishing	Total Use Benefits		
California	\$0.4	\$1.9	\$2.3	n/a	n/a
North Atlantic	\$0.1	\$1.2	\$1.2	n/a	n/a
Mid-Atlantic	\$1.5	\$38.5	\$39.9	n/a	n/a
South Atlantic	\$0.2	\$6.2	\$6.4	n/a	n/a
Gulf of Mexico	\$0.6	\$5.5	\$6.2	n/a	n/a
Great Lakes	\$0.2	\$12.2	\$12.4	n/a	n/a
Inland	n/a	\$2.6	\$2.6	n/a	n/a
Total (weighted)	\$3.0	\$70.0	\$72.9	n/a	n/a

^a Discounted to account for lag in implementation and lag in time required for fish lost to I&E to reach a harvestable age.

^b Regional numbers are unweighted. National totals are sample-weighted and include Hawaii.

^c EPA estimated non-use values only qualitatively.

Source: U.S. EPA analysis, 2004.

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